## CLAIMS

What is claimed is:

1. A drive circuit rectifying DC and AC signals to drive an electrical load comprising:

(a) a first bidirectional switch electrically connected at an input side to a piezoelectric transformer and at an output side to an electrical load; and

(b) a comparator circuit electrically connected about said first bidirectional switch, said comparator circuit comparing a present voltage value at said electrical load and a desired voltage value at said output side, said comparator circuit closing said first bidirectional switch thereby directing a high-frequency signal from said piezoelectric transformer into said electrical load when said high-frequency signal crosses said present voltage value, said comparator circuit opening said first bidirectional switch when said high-frequency signal reaches said desired voltage value.

2. A drive circuit rectifying DC and AC signals to drive an electrical load comprising:

(a) a first bidirectional switch electrically connected at an input side to a piezoelectric transformer and at an output side to an electrical load;

(b) a comparator circuit electrically connected about said first bidirectional switch, said comparator circuit comparing a present voltage value at said electrical load and a desired voltage value at said output side, said comparator circuit closing said first bidirectional switch thereby directing a high-frequency signal from said piezoelectric transformer into said electrical load when said high-frequency signal crosses said present voltage value, said comparator circuit opening said first bidirectional switch when said high-frequency signal reaches said desired voltage value; and

(c) a second bidirectional switch electrically connected at a first end between said piezoelectric transformer and said comparator circuit and terminated at a second end, said first bidirectional switch and said second bidirectional switch driven in opposite phase and charge direction relative to said electrical load.

3. The drive circuit of claim 2, wherein said second bidirectional switch is a MOSFET shunted full-wave bridge.

4. The drive circuit as in claim 1 or 2, further comprising a feedback circuit at said output side, said feedback circuit holding a voltage from said input side based on response to said output signal by said electrical load, said feedback circuit directing said voltage into said electrical load when said comparator circuit closes said first bidirectional switch.

5. The drive circuit of claim 4, wherein said electrical load is comprised of a capacitive element maintaining charge between switching instances.

6. The drive circuit of claim 4, wherein said electrical load is comprised of a transductive element and paralleled capacitive element, said capacitive element maintaining charge between switching instances.

7. The drive circuit of claim 4, wherein said piezoelectric transformer is a multi-tap device accepting an AC signal input and generating a plurality of AC voltages, said drive circuit further comprising a filter capacitor at said output side to maintain a voltage level at said output side during switching of said first bidirectional switch.

8. The drive circuit of claim 4, wherein said piezoelectric transformer is a multi-tap device accepting an AC signal input and generating a plurality of AC voltages.

9. The drive circuit of claim 4, wherein said first bidirectional switch is a MOSFET shunted

full-wave bridge.

10. A power distribution system rectifying DC and AC signals to drive a plurality of electrical loads comprising:

(a) a power supply;

(b) a plurality of drive elements each electrically connected at a first end to said power supply and at a second end to an electrical load, each said drive element comprised of an AC generator electrically coupled to a piezotransformer electrically coupled to a drive circuit, said drive circuit comprised of a bidirectional switch electrically connected at an input side to said piezoelectric transformer and at an output side to said electrical load and a comparator circuit electrically connected about said bidirectional switch, said comparator circuit comparing a present voltage value at said electrical load and a desired voltage value along at said output side, said comparator circuit closing said bidirectional switch thereby directing a high-frequency signal from said piezoelectric transformer into said electrical load when said high-frequency signal crosses said present voltage value, said comparator circuit opening said bidirectional switch when said high-frequency signal reaches said desired voltage value.

11. A power distribution system rectifying DC and AC signals to drive a plurality of electrical loads comprising:

(a) a power supply;

(b) a bulk converter converting a power from said power supply to a level DC power;

(c) a power storage element storing said level DC power; and

(d) a plurality of drive elements each electrically connected at a first end to said power storage element and at a second end to an electrical load, each said drive element comprised of an AC generator electrically coupled to a piezotransformer electrically coupled to a drive circuit, said drive circuit comprised of a bidirectional switch electrically connected at an input side to said piezoelectric transformer and at an output side to said electrical load and a comparator circuit electrically connected about said bidirectional switch, said comparator circuit comparing a present voltage value at said electrical load and a desired voltage value at said output side, said comparator circuit closing said bidirectional switch thereby directing a high-frequency signal from said piezoelectric transformer into said electrical load when said high-frequency signal crosses said present voltage value, said comparator circuit opening said bidirectional switch when said high-frequency signal reaches said desired voltage value.